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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/523,735	03/13/2000	Yasuyuki Unno	684.2700CIP	7033

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EXAMINER

KIM, PETER B

ART UNIT PAPER NUMBER

2851

DATE MAILED: 05/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/523,735	UNNO, YASUYUKI	
	Examiner	Art Unit	
	Peter B. Kim	2851	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 April 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11,12,14-16,18-20,22 and 24-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11,12,14-16,18-20,22 and 24-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All   b) ☐ Some \*   c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/123,443.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

Applicant's arguments filed on Apr. 21, 2003 (paper #18) have been fully considered.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11, 12, 18, 20, 27, 28, 30, 32, 34-37 and 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winker et al. (Winker) in view of Oshida et al. (Oshida) (5,677,755).

Winker discloses lenses or optical element that cause birefringence (col. 3, lines 7-20, col. 5, lines 6-17); and at least one optical element for substantially eliminating the birefringence caused by the lenses (col. 3, line 45 – col. 4, line 26, col. 5, lines 17-30). Winker also discloses at least one optical element that has form birefringence or causing a change in polarization of light that passes through it (col. 3, line 45 – col. 4, line 26, col. 5, lines 17-30). Winker also discloses the amount of birefringence of at least one optical element is substantially the same as the amount of birefringence of the lenses as a whole, wherein the sign of birefringence is opposite (col. 3, line 45 – col. 4, line 26, col. 5, lines 17-30). However, Winker does not disclose a projection exposure apparatus comprising such optical element is disposed between the plurality of lens and an image plane of the projection optical system. Oshida teaches in the abstract and Fig. 14, a projection exposure apparatus with an illumination system (Fig. 14), reticle (21), projection optical system (31) and wafer (41) where the optical element or the

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polarizer (33) is located between the plurality of the lens and the image plane. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize the optical elements of Winker in a projection exposure apparatus of Oshida in order to minimize or eliminate birefringence inherent in the optical lenses and to increase the resolution as taught by Oshida in col. 11, lines 43-46.

Claims 19, 26, 29, 40, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winker in view of Oshida et al. as applied to claim 18 above, and further in view of Takahashi et al. (Takahashi).

The further difference between the claimed invention and the modified Winker is illumination of the reticle with slit-like light and scanning the reticle and the wafer at a speed ratio corresponding to a projection magnification of the projection optical system and developing of the wafers. Takahashi discloses illuminating the reticle with slit-like light (col. 4, lines 1-42) and scanning the wafer and reticle at a speed ratio corresponding to the magnification (col. 7, lines 15-30). Takahashi further discloses exposing the wafer and developing the wafer (col. 14, lines 24-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Winker by providing the scanning type exposure apparatus to because the need to minimize or eliminate birefringence is consistent in both step-and-repeat type devices as in '060 and the scanning type device as in Takahashi.

Claims 16, 24, 25, 31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winker in view of Oshida et al. as applied to claims 11, 18, 27 and 28 above, and further in view of Lesniak.

The further difference between the claimed invention and the modified Winker is the optical element having a stress distribution and the stress distribution used to cancel the birefringence. Lesniak discloses an optical element which exhibits birefringence due to a stress distribution (abstract, col. 5, lines 50-63). Since the optical element of Lesniak exhibits birefringence due to a stress birefringence, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the optical element of Lesniak to the invention of Winker as the optical element which is used to cancel the birefringence of the lenses provided that the optical element of Lesniak exhibits birefringence equal but opposite to the birefringence produced by the lenses of Winker.

Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Winker in view of Oshida et al. and Lesniak as applied to claim 33 above, and further in view of Takahashi.

The further difference between the claimed invention and the modified Winker is developing of the wafer. Takahashi further discloses exposing the wafer and developing the wafer (col. 14, lines 24-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide developing as taught by Takahashi after exposing the wafer as disclosed in '060 because the exposed wafer must be developed to form the necessary circuit patterns.

Claims 14, 15, 22, 38, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winker in view of Oshida et al. as applied to claims 11, 18, 27, and 28 above, and further in view of Aoyama et al. (Aoyama) article.

The further difference between the claimed invention and the modified Winker is producing form birefringence by grating having a period smaller than the wavelength used and

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providing the grating on the surface of the lenses. Aoyama discloses that form birefringence is produced using ultra-high spatial frequency gratings with a period smaller than the wavelength used (table 1). Aoyama also discloses in Fig. 6 and 10, lenses with grating provided on the surface. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide another type of an optical element that exhibits birefringence in order to eliminate unwanted birefringence produced by lenses of Winker.

### ***Response to Arguments***

Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

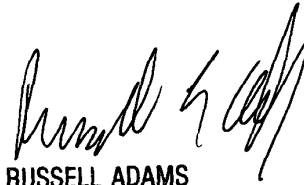
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (703) 305-0105. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams, can be reached on (703) 308-2847. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Peter B. Kim  
Patent Examiner  
May 19, 2003



RUSSELL ADAMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800